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CASE FOR THE CREATION OF UK RESEARCH AND INNOVATION

A new public body in place of the seven Research Councils, Innovate UK, and the research and knowledge exchange functions of the Higher Education Funding Council for England

JUNE 2016

Contents

1. Summary

1. The UK research and innovation systems are world-leading. The existing landscape and the bodies within it have evolved over many years and delivered enormous success and benefit to the UK economy and our wider well-being. However, the challenges facing the world are complex, and increasingly require multi- or inter-disciplinary approaches and increased collaboration across traditional boundaries and organisations.

2. A number of recent reviews and consultations have considered how we can build on the strengths of the current research and innovation landscape to ensure that the system is sufficiently integrated, strategic and agile to meet those future challenges, and to further develop our national capability to drive discovery and growth. In developing these proposals, we have drawn on: responses to the recent Higher Education Green Paper, 'Fulfilling our potential: teaching excellence, social mobility and student choice'[1] (the HE Green Paper); the stakeholder survey on Innovate UK[2]; the Triennial Review of the Research Councils[3]; and the independent review by Sir Paul Nurse[4]. The Conservative Party Manifesto 2015[5] stated: 'Through the Nurse Review of Research Councils, we will seek to ensure that the UK continues to support world-leading science, and invests public money in the best possible way'.

3. The Government announced at Spending Review 2015[6] that we would take forward the recommendations of the Nurse Review to create a single non-departmental public body (NDPB) operating at arm's length from Government that brings together the seven Research Councils[7]. We also announced that we would look to integrate Innovate UK within the new body while retaining its distinctive business focus and separate funding stream. Wider changes to the higher education funding system set out in the HE Green Paper also provide an opportunity to further strengthen, streamline and simplify the research and innovation landscape by integrating the research funding functions currently performed by the Higher Education Funding Council for England (HEFCE). Responses to the consultation held on the HE Green Paper highlighted the need to protect the Dual Support system (explained in paragraph 25) within a single body. We agreed with this and for the first time, subject to Parliament, we will provide a legal basis for that protection in England.

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[1] www.gov.uk/government/consultations/higher-education-teaching-excellence-social-mobility-and-student-choice
[2] https://bisgovuk.citizenspace.com/innovation/innovate-uk-and-research-uk/consult_view
[3] www.gov.uk/government/publications/triennial-review-of-the-research-councils
[4] www.gov.uk/government/collections/nurse-review-of-research-councils
[5] www.conservatives.com/manifesto
[6] www.gov.uk/government/publications/spending-review-and-autumn-statement-2015-documents/spending-review-and-autumn-statement-2015
[7] In alphabetical order, the seven Research Councils are: the Arts and Humanities Research Council (AHRC); the Biotechnology and Biological Sciences Research Council (BBSRC); the Engineering and Physical Sciences Research Council (EPSRC); the Economic and Social Research Council (ESRC); the Medical Research Council (MRC); the Natural Environment Research Council (NERC); and the Science and Technology Facilities Council (STFC).

4. This case proposes the creation of a single new NDPB to integrate research and Innovate UK functions, which offers an opportunity to strengthen the strategic approach to future challenges and maximise value from Government's investment of over £6 billion per annum in research and innovation. The new body will be known as UK Research and Innovation (UKRI) to reflect the full range of its functions. It will deliver:

    - a greater focus and capacity to deliver on cross-cutting issues that are outside the core remits of the current funding bodies, such as multi- and inter-disciplinary research, enabling the system to respond rapidly and effectively to current and future challenges;
    - a strengthened, unified voice for the UK's research and innovation funding system, facilitating the dialogue with Government and partners on the global stage;
    - improved collaboration between the research base and the commercialisation of discoveries in the business community, ensuring that research outcomes can be fully exploited for the benefit of the UK;
    - better mechanisms for the sharing of expertise and best practice – for example, around management of major projects and large capital investment – driving up the effectiveness of decision-making;
    - more time for research and innovation leaders to focus on strategic leadership through the centralisation of back and middle office functions and the reduction of administrative responsibilities; and
    - improved quality of evidence on the UK's research and innovation landscape through the pooling of multiple datasets and information sources, underpinning effective funding decisions.

5. This will help to maximise the effectiveness of the system, improving value for money. In addition, this reform will remove unnecessary duplication across the research funding landscape, enabling clear governance and resulting in a simple, easier and more agile system that will benefit researchers while generating increased efficiency in the medium term.

6. In parallel, the creation of the Office for Students (OfS)[8] will simplify the regulatory landscape by bringing together under a single sector regulator the regulatory functions of HEFCE and the Director of Fair Access (DFA). This new body, with a specific focus on promoting the student interest, will have a remit to introduce a single regulatory framework for all HE providers in England. It will bring together the expertise and shared agenda of HEFCE and the DFA, supported currently by the Office for Fair Access, to streamline their functions and give a single body the responsibility for all widening participation functions and student access spending.

7. UKRI will work closely with the OfS to ensure a coordinated and strategic approach to the funding of teaching and research in England. Subject to Parliament, the Higher

[8] www.gov.uk/government/publications/office-for-students-business-case

Education and Research Bill[9] (the HE and Research Bill) will ensure that OfS and UKRI can and do share relevant information and data, and work together on areas of shared interest. This will include: UKRI and OfS working together to assess the financial health of the higher education sector in England, ensuring that UKRI has access to information on overall financial health so that its funding decisions safeguard research sustainability; UKRI and OfS working together in the area of knowledge exchange; UKRI working with OfS on the assessment process for Research Degree Awarding Powers (RDAPs); and UKRI and OfS sharing data to inform research and evaluation studies, and providing regular assurance to satisfy respective accountability responsibilities.

8. These reforms together will result in a reduction in the number of Department for Business, Innovation and Skills (BIS) Partner Bodies in the higher education funding and regulatory landscape from 10 to 2, whilst enhancing delivery of policy objectives and preserving the identity and autonomy of UKRI's constituent parts.

9. Other bodies in the research and innovation funding landscape not discussed in this case will not be directly affected by these reforms.

[9] www.gov.uk/government/collections/higher-education-and-research-bill

2. Strategic Context

10. The UK has a world-leading reputation in research and innovation. Scientific and technological advancements have revolutionised the way we lead our lives and driven prosperity and societal well-being. For every £1 invested by the Government in research and development, private sector productivity rises by 20 pence annually, in perpetuity. Our share of highly cited articles is second only to the US, and the UK has overtaken the US to rank first by field-weighted citation impact. The UK ranks 10th in the Global Competitiveness Index in 2015/2016 overall, up from 13th in 2009/10. On the level of university-industry collaboration in research and development (R&D) the UK is ranked 4th on this index, and is 2nd in the world for the quality of its scientific institutions.

11. At the Spending Review, Government announced that it would protect science and research resource funding at £4.7 billion per annum in real terms for the rest of the Parliament; commit £1.5 billion to a new Global Challenges Research Fund between 2016 and 2021; and provide a record £6.9 billion capital investment in new equipment, new laboratories and new research institutes across the UK between 2015 and 2021. With the introduction of New Innovation Finance Products, the Government is also protecting spending on business-led innovation in cash terms over the course of the Spending Review period.

12. We need to ensure we are making the most of this investment. A number of recent reviews of the institutional funding landscape for research and innovation have considered how we can build on its current strengths to ensure that the system is sufficiently strategic and agile to meet future challenges, and to deliver national capability for the future that drives discovery and growth.

13. The Triennial Review of the UK's seven Research Councils (April 2014)[3] identified the potential duplication of processes and underpinning procedures across the Councils, particularly in respect of back and middle office functions and administration. The Councils have made significant progress in working together through Research Councils UK (a voluntary partnership) to address these issues. However, there are limits imposed by the current legal framework on how far the existing organisations can go to deliver a strategic vision, operate multi- and inter-disciplinary research programmes and remove duplication. There is more to do to embed and build on the progress to reduce bureaucracy and release our scientific and research leaders from administrative burdens. These talented and expert leaders should be free to focus on the strategic leadership of their research communities, and fund research on the basis of excellence determined through peer review.

14. In 2014, BIS and HMT jointly commissioned Sir Paul Nurse to further consider how Research Councils can evolve to support research in the most effective ways - reflecting the requirements to secure excellence, promote collaboration and allow agility, and in ways that best contribute to sustainable growth. Sir Paul's central recommendation was the 'evolution of Research Councils UK into a formal organisation with a single Accounting Officer, which can support the whole system to collectively become more than the sum of its parts, through: speaking with a strengthened voice to Government; taking responsibility for delivering cross-Council

strategy; and simplifying transactional operations, aimed at reducing the burden of administration currently placed on the heads of Research Councils'[4].

15. Sir Paul's report and recommendations describe a research landscape which is best able to respond to current and future challenges. He found that 'the research endeavour has to be permeable and fluid, allowing the ready transfer of ideas, skills and people in all directions between sectors, research disciplines, the span of the research endeavour, and its potential beneficiaries'[4].

Working across disciplines and boundaries

16. This fluidity will be particularly important for enhancing support for multi-disciplinary and inter-disciplinary research, and research addressing societal needs and emergencies which span a range of research disciplines and require a number of organisations to work together – a key theme in Sir Paul's recommendations. This type of research is becoming increasingly important. For example, ensuring the ability to work swiftly and strategically across disciplines will be a critical part of implementation of the new Global Challenges Research Fund. However, it is not within the legal remit of any of the Research Councils to hold, manage or distribute the necessary multi- and inter-disciplinary grants from the Fund.

17. This Fund will help keep the UK at the forefront of global research, leading the way on major global challenges, such as Ebola, where we have always played a significant role. The £1.5 billion investment is a key part of Government's overall Official Development Assistance (ODA) strategy. Its importance has already been made clear. Earlier this year, working with the Medical Research Council, we made £1 million available as part of a Rapid Response to the Zika virus outbreak. The reforms discussed in this case will help ensure we can maximise the value from this new fund, and similar cross-cutting programmes.

Innovation and fostering further collaboration

18. In the Spending Review, the Chancellor stated: 'The Government is taking forward the recommendations of Paul Nurse's independent review and, subject to legislation, will introduce a new body – Research UK – which will work across the seven Research Councils. This will take the lead in shaping and driving a strategic approach to science funding, ensuring a focus on the big challenges and opportunities for UK research. The government will also look to integrate Innovate UK into Research UK in order to strengthen collaboration between the research base and the commercialisation of discoveries in the business community. Innovate UK will retain its clear business focus and separate funding stream'[6].

19. Sir Paul Nurse's review found that, by utilising their collective convening power, the Councils and Innovate UK have been able to promote interactions between the academic and business communities. But he identified the need for a 'smoother pathway to more applied research'[4], observing that the integration of innovation and research funding functions could help address this.

20. Bringing together research and innovation funding functions under a single organisation, led by a strategic board comprising representatives from both

communities, will drive up awareness among research leaders of the needs and interests of the business sector, as well as enabling the business community to identify opportunities arising from research. This will catalyse more informed funding decisions, maximising benefits to the UK economy from the Government's significant investment in research and innovation.

21. One of Innovate UK's priorities is to turn scientific excellence into economic impact and deliver results through innovation, in collaboration with the research community. It works closely with the research councils to identify ways co-operation can be increased. Integration of the bodies will help simplify and streamline co-operation to the benefit of both communities.

22. Substantial innovation already happens across the UK which is not informed or impacted by the research base. We want this innovation to continue and flourish. Aligning and creating a combined research and innovation support landscape will facilitate opportunities for businesses and innovators to take forward their ideas more easily.

23. A single legal structure will remove the need for Government to intervene with Partner Bodies to develop workaround solutions to the limitations imposed by the current landscape. As the need for flexibility and agility across discipline boundaries increases the existing structures become less efficient and effective. A further advantage arising from bringing together research and innovation funding bodies into a single organisation is that the centralisation of administrative functions, including grant application systems, should simplify processes for funding recipients. Although the biggest benefit will be the strategic coherence to the Government investment of over £6 billion per annum, ensuring that funding decisions deliver the greatest impact and value for money.

24. Roundtable discussions and a stakeholder survey were held on the proposal to integrate Innovate UK into an overarching research and innovation funding body. Responses were analysed alongside responses to the consultation held on the HE Green Paper, a summary of which has been published[10].

The importance of maintaining core success principles

Dual Support

25. The Dual Support system for research funding combines project funding for excellent research proposals, which is forward-looking and assessed through peer review – currently delivered by the Research Councils, with formula based quality-related research funding that rewards performance retrospectively based on peer review and proven impact from the research – currently delivered by HEFCE. The system sustains a dynamic balance between research which is strategically relevant and internationally peer reviewed and research which is directed from within institutions.

[10] www.gov.uk/government/consultations/higher-education-teaching-excellence-social-mobility-and-student-choice

26. Changes to the higher education landscape outlined in the HE Green Paper present a further important opportunity to improve the research funding landscape to make it more strategic, coherent and effective. The HE Green Paper proposed that, subject to Parliament, HEFCE would no longer have a role in regulating the higher education system or allocating grant funding for teaching and research in England. It stated that one option for the future design of the research landscape was to deliver Dual Support through an overarching body that brings together Research Council functions with management of institutional research funding for England, with conditions on the funding (for example, separating each stream) which would ensure the integrity of the Dual Support funding system. The white paper 'Higher Education: Success as a Knowledge Economy'[11], confirmed our intention to integrate these functions in the new body.

27. The integration of HEFCE's England-only research and knowledge exchange functions within the new body will enable greater strategic coordination across the research funding landscape. It will also strengthen the quality of evidence on the UK's research base and ensure a more joined-up approach in areas such as skills and UK-wide capital investment, where both HEFCE and the Research Councils have pioneered innovative funding approaches.

28. Responses to the consultation held on the HE Green Paper, a summary of which has been published[10], highlighted the need to protect the Dual Support system within a single body. We agreed and for the first time, subject to Parliament, we will provide a legal basis for that protection in England. The Secretary of State will allocate hypothecated budget lines for the two funding streams, as now, but will additionally be required to consider the balance across them. The legislation will also enshrine a clear segregation between the body's UK-wide remit and the England-only functions currently undertaken by HEFCE. This will be an important reassurance to the research community.

Haldane Principle for research funding

29. The Haldane Principle is taken in this context to mean that decisions about the allocation of funding to research projects are best taken independently of Government, by those who have the expertise and experience to know how the money will be spent. Government has adhered to this principle over many decades, clarified its interpretation in the Science Budget Allocations booklet 2010[12], and restated its commitment to it in the 2014 publication 'Our plan for growth: science and innovation'[13] and in the HE Green Paper[1]. Respondents to the HE Green Paper consultation emphasised that delegated decision-making is a key aspect of Haldane, with discipline-specific experts needing to have responsibility for funding decisions in their areas. Our commitment to the Haldane Principle, including strong autonomous leadership in specific research discipline areas, will underpin reform of the research and innovation funding landscape: UKRI will be an NDPB, at arm's length from

[11] www.gov.uk/government/publications/higher-education-success-as-a-knowledge-economy-white-paper
[12] www.gov.uk/government/uploads/system/uploads/attachment_data/file/422477/bis-10-1356-allocation-of-science-and-research-funding-2011-2015.pdf
[13] www.gov.uk/government/uploads/system/uploads/attachment_data/file/387780/PU1719_HMT_Science_.pdf

government, and we will retain and strengthen discipline-specific leadership within the new body by establishing nine Councils with delegated autonomy and authority. As currently, the Secretary of State will set budgets for each of the nine Councils through an annual grant letter, taking advice from UKRI's board on strategic priorities and on the balance of funding between research disciplines.

30. Further detail on the structure and governance of UKRI is set out in Annex A.

3. Aims and Outcomes

31. The strengths of the UK research and innovation system are clear. But the system has the potential to become even more efficient and effective. In this context, our aim is to build on the strengths of the current system to ensure that our research and innovation system is sufficiently integrated, strategic and agile to meet future challenges, and to deliver national capability for the future that drives discovery and growth.

32. This requires a research and innovation infrastructure that retains the strengths of our current system:

- research funding that is competitive and rewards excellence;
- excellence that is judged on the basis of peer review by academics with the necessary expertise and experience;
- strong discipline leadership with responsibility and autonomy for funding and future skills development in their areas;
- a balanced dual funding system that rewards excellent and impactful research wherever it is found; and
- a distinctive business focus and separate funding stream focused on business-led innovation and the translation of world-class research and ideas into growth in the UK economy and improvements in our lives and well-being.

33. It also requires changes to a landscape that has been formed over the last 100 years or more, so that it can better adapt to meet the opportunities, challenges and uncertainties that will face us over the next 100 years. Those changes include:

- a single legal body established at arm's length from Government;
- removing the barriers to cross-cutting funds being held, managed and distributed at arm's length from Government, while minimising administrative overheads and avoiding the need to work around current legal structures, adding to an already complex landscape;
- eliminating duplication to ensure the new arrangements are efficient and effective, and to ensure all available funding is directed to support research, translation and innovation, not on administrative overheads; and
- establishing a system that balances autonomy and independence with cross-cutting ability and flexibility, with decisions delegated to the experts best able to take them for the benefit of their research discipline or distinctive area of expertise.

34. The outcomes our reforms will deliver include:

- a strengthened strategic approach to future challenges and a maximisation of the value and benefit from Government's investment of over £6 billion per annum in research and innovation;

- a greater focus on cross-cutting issues that are outside the core remits of the current funding bodies, such as multi- and inter-disciplinary research, enabling the system to respond rapidly and effectively to current and future challenges;
- a strengthened, unified voice for the UK's research and innovation funding system, facilitating the dialogue with Government and partners on the global stage;
- improved collaboration between the research base and the commercialisation of discoveries in the business community, ensuring that research outcomes can be fully exploited for the benefit of the UK;
- better mechanisms for the sharing of expertise and best practice – for example, around management of major projects and large capital investment – driving up the effectiveness of decision-making;
- more time for research and innovation leaders to focus on strategic leadership through the centralisation of back and middle office functions and the reduction of administrative responsibilities;
- improved quality of evidence on the UK's research and innovation landscape through the pooling of multiple datasets and information sources, underpinning effective funding decisions; and
- the removal of unnecessary duplication across the research funding landscape while ensuring clear governance and spans of control, resulting in a simple, easier and more agile system that will benefit researchers.

4. Consideration of Options

35. In this section we show our assessment of the options which have been considered for the future of the institutional research and innovation landscape.

The need for research and innovation funding and the need for central government to carry out this function

36. It is Government policy, set out in the Spending Review[6], to protect science and research resource funding at £4.7 billion per annum in real terms for the rest of the Parliament; commit £1.5 billion to a new Global Challenges Research Fund between 2016 and 2021; and provide a record £6.9 billion capital investment in new equipment, new laboratories and new research institutes across the UK between 2015-2021. With the introduction of New Innovation Finance Products, the Government is also protecting spending on business-led innovation in cash terms over the course of the Spending Review period.

37. The need for on-going scientific discovery is amplified by the vast social and environmental challenges facing nations globally, and there are a number of characteristics of the science and research system which mean that government support is necessary to remain at the forefront of solving these challenges. These include the market failures set out in the box below.

Co-ordination failures:

The science and research system involves many parties including large and small businesses and education institutions. The national research infrastructure is made up of resources that provide value for many of the users and would not be replicated in a free market.

Externalities:

As many of the potential returns to R&D investment accrue to other parties than the one incurring the costs, this leads to an inefficiently low level of R&D investment in society. There is a lack of incentive for private firms to invest to a socially optimal level as they will not reap all the benefits. This can be addressed through allowing a private monopoly through intellectual property rights. However, protecting these rights can be difficult and prevents society from deriving the full potential benefits from research. Providing public funding for R&D and making knowledge public leads to more socially optimal levels of provision.

Imperfect information:

Science, research and innovation often have uncertain outcomes and take long periods of time for the returns to mature. When research is undertaken, it is often unclear to whom the returns will accrue and the size of the returns. The lack of information on the likelihood and nature of returns can prevent credit being available to finance major research capital investments, which often have large fixed costs.

Natural monopoly:

Major research capital investments face high start-up costs, such as construction and equipment costs. Once the capital investment is complete, the costs associated with using this research capital are relatively low, but the economic returns to using it are high. In this situation, it is not feasible to create a competitive market with multiple similar investments undertaken by different parties. Where there are significant externalities, as described above, a private monopoly is unlikely to work as the private returns may not be sufficient to cover the costs of the up-front investment.

Systems failures:

Absorptive capacity is a firm's ability to identify, assimilate, transform and apply valuable external knowledge. Firms often need to have a level of understanding of the existing scientific knowledge to be able to assimilate and exploit new research from outside their organisation and to carry out their own leading-edge research. As described above the 'Imperfect information' on the returns to investing in science may lead to private investors not providing the required level of investment in order to maintain this core level of understanding.

38. Economists are in general agreement that long-term sustainable growth, particularly in developed economies, rests ultimately on expanding the frontiers of knowledge. R&D contributes to growth primarily through creating technological progress and by delivering a supply of highly-skilled workers to the labour force. R&D investment generates strong positive economic impacts. Frontier Economics (2014) found that existing literature tends to estimate private rates of return to R&D investments of around 20-30% on average[14]. Evidence on the returns to public investment in science is less common in the literature. Recent research suggests an economy-level rate of return of 20% for public investment in R&D[15]. Furthermore, there is a substantial body of evidence to demonstrate that public investment in research and innovation both creates social and economic impact and "crowds in" private investment in R&D.

[14] Frontier Economics (2014), 'Rates of return to investment in science and innovation'
[15] Haskel, J., Hughes, A., & Bascavusoglu-Moreau, E. (2014), 'The Economic Significance of the UK Science Base'

Evidence suggests an extra £1 of public investment will lead to an increase of between £1.13 and £1.60 private investment in R&D[16].

39. The OECD refers to knowledge-based economies to describe the trends in advanced economies towards greater dependence on knowledge, information and high-level skills[17]. Recent evidence shows that across many developed economies knowledge-based capital is progressively becoming more intensely used and is increasingly the largest form of business investment and a key contributor to economic growth in advanced economies. It is increasingly unlikely that any country will be able to build sustainable and long-term prosperity simply from cheap labour, proprietary capital or natural resources. The UK therefore has to compete on the basis of its research and innovation capacity, not least because its comparative advantage is disproportionately derived from R&D and innovation-intensive sectors. Investing in knowledge and innovation is therefore vital for the sustainability of the UK economy and vibrancy of the innovation system.

40. As research and innovation are global undertakings, a national-level approach to funding is necessary, so central government rather than local government intervention is most appropriate. The increasing importance of emerging powers, who take a more top-down approach to science investment, requires a more active role from government to ensure we are in a position to make the most of emerging opportunities. The UK is particularly well placed to carry out publicly-funded R&D as it has a world-leading research base. The UK is a highly productive research nation. With 0.9% of global population, 3.2% of R&D expenditure and 4.1% of researchers, the UK produces 9.5% of article downloads, 11.6% of citations and 15.9% of the world's most highly-cited articles (i.e. those in the top 1% of globally cited articles). On the leading measure of citation impact – Field Weighted Citation Impact (FWCI) – an index that controls for the tendency of certain subject areas or forms of publication to be more likely to attract citations than others – the UK is the leading research nation amongst core comparator countries with a large research base (G8 plus China[18])[19].

Could an existing body take on board these functions?

41. Currently, the research and innovation funding landscape consists of nine different NDPBs, each with an individual remit, and only able to fund research in the precise way set out by legislation. These legal limits mean that no existing body could take on the policy functions of the proposed new body.

42. An example of how the current research funding structure is unable to address today's challenges is in the allocation of the Global Challenges Research Fund. This Fund is a

[16] Economic Insight (2014), 'What is the relationship between public and private investment in science, research and innovation'
[17] OECD (2005), "The Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data: Oslo Manual, Third Edition" prepared by the Working Party of National Experts on Scientific and Technology Indicators, OECD, Paris, para. 71
[18] Note this measure includes Russia within the G8, although Russia's membership of the G8 was suspended in March 2014
[19] Elsevier (2013) "International Comparative Performance of the UK Research Base – 2013" A report prepared by Elsevier for the UK's Department for Business, Innovation and Skills

new resource funding stream for science announced as part of Spending Review 2015[20]. It provides £1.5 billion of resource spend over the next five years to ensure that UK research takes a leading role in addressing the problems faced by developing countries. The Fund will be allocated to research, across all disciplines, and independently of government, in line with the Haldane Principle as set out in paragraph 29. To do that effectively funding would need to be allocated to the Research Councils to hold and manage the peer review process to award funding and distribute the funds as a single process. The current legislative framework prevents that approach because it is not within the remit of any of the Research Councils to hold, manage or distribute the necessary inter-and multi-disciplinary grants from the Fund. This means the fund would need to be held by BIS. However, to ensure decisions about the allocation of funding to individual research projects are taken independently of Government, in line with the Haldane Principle, we would need to set up a workaround with the associated overheads.

43. In the future, we anticipate that more and more of the research and innovation needed to tackle the world's grand challenges will need to be inter- and multi-disciplinary. For example, a HEFCE report in 2015 found that 'UK interdisciplinary research is also growing in intensity, in line with a global trend'[21]. Sir Paul Nurse also noted in his report that 'Business problems are rarely focused on a single research discipline', going on to recommend that 'the Research Councils and Innovate UK should work closer together to deliver the multi-disciplinary research needed for business'[4].

44. The challenges the restrictive current research and innovation funding framework presents to the effective pooling of resources in order to deliver multi- and inter-disciplinary research - for example, through the Global Challenges Research Fund - mean that we do not have the optimal capability to undertake multi- and inter-disciplinary research. This presents an increasing risk to the UK's world-leading position in science, research and innovation.

45. The current research funding structure also leads to a large amount of duplication of functions and activities across the nine funding bodies. Some of this duplication could be reduced by the bodies working closer together. As outlined in their response to the HE Green Paper and the Nurse Review[22], Research Councils have already committed to a programme to improve the efficiency and effectiveness of their operations, and a move toward operating as a single collective organisation, underpinned by centrally-led common functions. However, there is further duplication that is unavoidable for separate NDPBs and the requirements placed on them through legislation. For example, each of the nine bodies are legally required to manage, monitor and report on their funding separately, with each separate accounting officer having in place finance teams, systems and processes, and the requirement in legislation to produce and lay separate annual accounts before Parliament.

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[20] UK aid: tackling global challenges in the national interest, DfID and HMT, November 2015, www.gov.uk/government/uploads/system/uploads/attachment_data/file/478834/ODA_strategy_final_web_0905.pdf

[21] www.hefce.ac.uk/pubs/rereports/Year/2015/interdisc/Title,104883,en.html

[22] Research Councils UK: response to the Higher Education Green Paper and the Nurse Review, RCUK, January 2015, www.rcuk.ac.uk/media/news/160115/

46. The administrative costs of the nine funding structures in 2014-15 are shown in Table 1.

Table 1: 2014-15 administrative costs for funding bodies

Funding Body	2014-15 Administrative Costs
NERC	£14 million
MRC	£24 million
STFC	£14 million
BBSRC	£16 million
AHRC	£4 million
EPSRC	£11 million
ESRC	£3 million
Innovate UK	£19 million
HEFCE	£2 million
Total	£105 million

Note

HEFCE's administrative costs were £25 million in 2014-15. HEFCE currently has responsibility for allocating teaching grants, as well as research grants. In the new system, it is envisaged that the teaching functions will move to the Office for Students. It has been estimated that 17 full-time equivalent posts in HEFCE are directly responsible for research and knowledge exchange functions[23]. As there were a total of 242 FTE staff at HEFCE in 2014/15, our estimate is that 7% (17/242) of the administrative costs are for continuous functions related to research and knowledge exchange funding. This was equal to £2 million in 2014-15. This is a lower bound assumption in the Impact Assessment for the HE and Research Bill[24], to give an estimate of the proportion of HEFCE's current administrative spend that could be attributed to research, as opposed to teaching, functions. This is not an indication of the precise intended split of staff between UKRI and OfS, which will be subject to further work on the detailed organisational design of UKRI. This estimate excludes the costs of the Research Excellence Framework (REF), which is currently being reviewed by Lord Stern.

[23] Source: Internal BIS estimates
[24] www.gov.uk/government/publications/higher-education-and-research-bill-impact-assessment

Could the Department for Business, Innovation and Skills provide these functions 'in house'?

47. As outlined in paragraph 29, the Government remains committed to the Haldane Principle, which is taken in this context to mean that decisions about the allocation of funding to research projects are best taken independently of Government and by those who have the expertise and experience to know how the money will be spent. Government has adhered to this principle over many decades, clarified its interpretation in the Science Budget Allocations booklet 2010[12] and restated its commitment to it in the 2014 publication 'Our plan for growth: science and innovation'[13].

48. Delegated decision-making is a key aspect of Haldane, with discipline-specific experts needing to have responsibility for funding decisions in their areas.

49. It would therefore be inappropriate for BIS to deliver research and Innovate UK funding in house. BIS also lacks the necessary skills and knowledge to manage technical and scientific research and Innovate UK programmes.

Does the service or function meet at least one of the Government's three tests for arm's length bodies?

a) Is this a technical function (which needs external expertise to deliver)?

Mainly. The majority of roles require technical and professional expertise, including commissioning and administering of research programmes, management of the peer review process and oversight of research institutes and specialist facilities. However, some roles are focused on corporate and administrative functions, such as Human Resources (HR), finance, IT and office management. By replacing the various bodies with a single body, we are reducing duplication of such functions.

b) Is this a function which needs to be, and be seen to be, delivered with absolute political impartiality (such as certain regulatory or funding functions)?

Yes. The Government's commitment to the Haldane Principle means that decisions on the allocation of funding to research projects must be taken independently of Government based on peer review assessment of research excellence. This ensures value for money in so far as science spending is directed towards the highest quality scientific proposals, as judged by scientific experts.

c) Is this a function which needs to be delivered independently of Ministers to establish facts and/or figures with integrity?

Yes. Research is a technical and specialist activity to generate new knowledge and data (including facts, figures and statistics). Some of the data generated by the research funding through this body will be used by the Office for National Statistics (ONS) and other government bodies as official government statistics. All the evidence generated by this funding route will be used to define the factual basis of a range of policy decisions, both in the UK and internationally. It is critical this is objective and impartial.

Consideration of alternative delivery models

50. Our approach to reform and option assessment has been guided by the following key principles:

- the need to strengthen strategic thinking on cross-cutting priorities and develop a more agile and responsive research and innovation funding system;
- the need to retain the world class strengths of the current system, including the Haldane principle, the Dual Support system and Innovate UK's distinct business-facing focus;
- the importance of subsidiarity, with decisions needing to be taken at the lowest effective level and leaders in particular fields of activity given full responsibility for decisions in their areas; and
- the need to reduce bureaucracy, freeing up research and innovation leaders to focus on strategic decision-making.

51. Our consideration has focused on two options which both involve the creation of a new public body:

i. Create a new body alongside the nine existing research and innovation funding bodies to establish mechanisms for supporting multi- and inter-disciplinary research

52. This option is to create a new body, alongside the nine existing research and innovation funding bodies, to establish mechanisms for supporting multi- and inter-disciplinary research. This option would result in 10 separate legal entities responsible for funding UK research and innovation, and therefore would not deliver many of the policy objectives outlined in section 3.

53. Research Councils have already identified 20%-25% operational savings as part of their change programme. Although these savings are already agreed, we consider that they would be more difficult for Research Councils to deliver under this option than under Option ii.

54. There would be some benefits associated with the formation of a new body to fund multi- and inter-disciplinary research. These are difficult to quantify, but a greater focus on cross-cutting issues, such as multi- and inter-disciplinary research should enable the system to respond rapidly and effectively to current and future challenges.

55. However, while we would expect some improvement in the delivery of multi- and inter-disciplinary research, maintaining and adding to the current fragmented research funding landscape would not realise the majority of the benefits outlined in section 3 and would add to the duplication of functions and activities of the existing nine research and innovation funding bodies that is outlined in paragraph 45, resulting in additional administrative costs.

56. We have therefore chosen not to pursue this option further.

ii. Create a single new research and innovation body

57. As set out in the HE Green Paper, we have an opportunity to look more broadly at the research and innovation funding landscape and deliver more far-reaching reform to address a number of limitations of the current system whilst retaining and building on its key strengths, to ensure that the UK's research and innovation system is sufficiently integrated, strategic and agile to meet future challenges, and to deliver national capability for the future that drives discovery and growth. This option takes full advantage of that opportunity.

58. The preferred option is to create one organisation that will facilitate greater strategic coordination of research and innovation activity, driving the UK's future productivity and growth, to be known as UKRI. UKRI will be an executive NDPB and will bring together the seven Research Councils, Innovate UK and the research and knowledge exchange functions currently performed by HEFCE in one organisation that will facilitate greater strategic coordination of research and innovation activity. As set out in paragraph 29, we will retain and strengthen discipline-specific leadership within the new body by establishing nine Councils with delegated autonomy and authority. As currently, the Secretary of State will set budgets for each of the nine Councils through an annual grant letter, taking advice from UKRI's board on strategic priorities and on the balance of funding between research disciplines.

59. The current public bodies landscape to deliver these functions is complex and the approach outlined here aligns with Cabinet Office's strategic transformation of the public bodies landscape and BIS' own simplification and transformational agenda, 'BIS 2020'.

60. The costs and benefits of this option are set out in section 5 below.

5. Appraisal of preferred option

61. The preferred option (option ii) is to create one organisation that will facilitate greater strategic coordination of research and innovation activity, driving the UK's future productivity and growth, to be known as UKRI. UKRI will be an executive NDPB and will bring together the seven research councils, HEFCE's research and knowledge exchange functions, and Innovate UK in one organisation that will facilitate greater strategic coordination of research and innovation activity.

62. The strategic case for and benefits of this option are clear, as outlined in previous sections. The biggest benefit will be the strategic coherence to the Government investment of over £6 billion per annum, ensuring that funding decisions deliver the greatest impact and value for money. This section sets out our indicative high-level estimates of the option's financial and economic costs and benefits, which will be refined alongside further work on the detailed organisational design.

Costs

63. There could be additional administrative costs associated with delivering a greater focus on cross-cutting issues that are outside the core remits of the current funding bodies, such as multi- and inter-disciplinary research. It is difficult to estimate the exact size of this cost, as it will depend on the final organisational design of UKRI. As an indicative scenario, based on the administrative costs of the current system shown in Table 1, we estimate that the cost of delivering these additional functions would be around £4 million per annum from 2018-19 onwards.

64. Funding recipients will see little change except for a simplified process, but there could be a very small transitional cost to researchers, research institutes and businesses as they familiarise themselves with UKRI. This could involve familiarisation with new email addresses and phone numbers. We estimate that these costs will be short term, and negligible.

65. There will also be a transitional administrative cost of establishing UKRI. This will depend on the final organisation design of UKRI, and so is difficult to quantify, but as an indicative scenario, we have assumed that it will be equal to the estimated annual cost of the new body's additional functions, with a £4 million transitional cost falling in 2017-18.

Benefits

66. As set out in paragraph 53, Research Councils have already identified 20%-25% of operational savings as part of their change programme. The creation of UKRI means that we can better embed these savings, and ensure that they lead to better outcomes and therefore better value for money for the taxpayer.

67. Currently, there are a number of functions and outputs that are duplicated across the Research Councils. UKRI provides the opportunity to remove this duplication, increasing efficiency and reducing some costs. Potential areas for consolidation

include services such as HR, procurement, finance services, auditing, IT and communications. In addition, there will be opportunities to remove duplication and improve strategic alignment in some specific programmes of work, such as business planning, grant administration and analytical and evaluation work (including annual reporting of impact and performance). The exact size and nature of these financial benefits will depend on the final organisational design of UKRI, and are difficult to quantify. We estimate that the total annual administrative cost of UKRI will be the sum of the administrative costs of the nine current funding bodies shown in Figure 1 (£105 million per annum), and the cost of delivering a greater focus on cross-cutting issues (£4m per annum)[25], outlined in paragraph 63. As an indicative scenario we have estimated that the administrative savings would be equivalent to 5% of this total annual administrative cost. This gives an estimated administrative annual saving of around £5 million per annum, from 2018-19 onwards.

68. There are wider economic benefits to the integration of the seven Research Councils, and the research functions of HEFCE. These reforms will deliver a greater focus on cross-cutting issues, such as multi- and inter-disciplinary research, enabling the system to respond rapidly and effectively to current and future challenges. These reforms will mean more time for research and innovation leaders to focus on strategic leadership, through the centralisation of back and middle office functions and the reduction of administrative responsibilities. These reforms will result in an improved quality of evidence on the UK's research and innovation landscape through the pooling of multiple datasets and information sources, underpinning effective funding decisions. There would also be benefits to researchers, research institutes and businesses from interaction with a simpler, easier and more agile research funding landscape, allowing more time to focus on research and innovation.

69. These economic benefits are difficult to quantify, but we have looked at an indicative scenario. For every £1 invested by the Government in R&D, private sector productivity currently rises by 20 pence, which means a 20% rate of return on this spend. The Science and research resource budget allocations for 2016 to 2020[26] show that the total Research Council allocation will be around £3 billion per year. For modelling purposes only, we have modelled that this allocation will continue to 2025-26. If these reforms resulted in a one percentage point increase in the rate of return, to 10% of this spend from 2020-21 onwards, this would give an economic benefit of around £230 million. This is the total economic benefit that would be accrued on the next 10 years of research spend (spend from 2016-17 to 2025-26, with an increase in the rate of return from 2020-21). The majority of the economic benefits would not be realised within the 10 year period, but over a much longer time period.

70. There are further economic benefits to the integration of Innovate UK and research funding. Bringing together research and innovation funding functions under a single organisation - led by a strategic board comprising representatives from both communities - will result in a strengthened, unified voice for the UK's research and

[25] We have assumed that the administrative cost of research and innovation funding is constant, in cash terms, between 2014-15 and 2016-17. This is based on internal BIS analysis of the administrative budgets for 2015-16 and 2016-17

[26] Science and research funding allocation: 2016 to 2020, BIS, March 2016 (www.gov.uk/government/publications/science-and-research-funding-allocation-2016-to-2020)

innovation funding system, facilitating the dialogue with Government and partners on the global stage. These reforms will result in improved collaboration between the research base and the commercialisation of discoveries in the business community, thereby ensuring that research outcomes can be fully exploited for the benefit of the UK. This will catalyse more informed funding decisions, maximising benefits to the UK economy from the Government's significant investment in research and innovation.

71. These economic benefits are difficult to quantify, but we have considered an indicative scenario. The returns to innovation support are estimated to be 50 pence per £1 invested[27]. With the introduction of New Innovation Finance Products, spending on business-led innovation for the period 2016-2020 will remain flat, in cash terms, and for 2019/20 will be around £470 million. For this indicative scenario we have assumed that this annual allocation will continue to 2025-26. If these reforms resulted in a one percentage point increase in the social rate of return, to 10% of this spend from 2020-21 onwards, this would give an additional economic benefit of around £20 million. This is the total additional economic benefit, excluding leverage effects, that would be accrued on the next 10 years of innovation spending under the given scenario (spend from 2016-17 to 2025-26, with an increase in the rate of return from 2020-21). The majority of the economic benefits would not be realised within the 10 year period, but over a much longer time period.

72. In addition to boosting productivity, science, research and innovation produces other important benefits that are harder to monetise but clearly demonstrated by strong case study evidence. Such non-market benefits include improved health and wellbeing, better development of public policy and delivery of public services, and cost avoidance through resilience to shocks. We would expect the strengthened strategic approach to future challenges that would be delivered by these reforms to result in improvement in the level of these non-market benefits.

Net Present Value

73. The estimated 10 year net present value (NPV) of Option ii is £250 million. This takes into account the additional administrative costs of setting up UKRI and delivering the new inter- and multi-disciplinary functions, and the economic benefits of the reforms. The Regulatory Impact Assessment for this reform[24] compares the NPV of this option with those of option i and the status quo (both discounted here because they would not meet the policy intent as set out in previous sections).

Note

All costs and benefits should be seen as broadly indicative and subject to change following more detailed work on the design of UKRI, as well as the timing and nature of the transition to this new body.

The implementation timetable has not been finalised but for the purposes of this assessment, we have assumed that UKRI will be operational from 2018-19, with

[27] This is the total benefit to the immediate recipients of the funding, and the spillover benefit to the wider economy.

transitional costs falling in 2017-18. We will work to ensure the final implementation timetable aligns with that of the OfS.

6. Transitional Arrangements

74. Work strands are being developed to take forward transitional planning with key areas to include:

    - communication with Partner Organisations staff and external stakeholders;
    - organisational design;
    - staff transition arrangements;
    - board and senior appointments;
    - financial planning and budget transfers;
    - IT; and
    - data and analysis.
    - Other areas, for example estates, are being taken forward through the wider BIS 2020 reform.

75. There will be a dedicated reform planning team resourced within BIS, which will work closely with Research Councils, HEFCE and Innovate UK to plan the transition. The timetable for transition is subject to Parliament. The majority of transitional work will be carried out using internal resources, freed up from other areas of work in BIS and affected Partner Organisations. It is anticipated that specialist advice will also be sought to manage and develop the approach to particular work strands, for example further legal advice. Some transformation costs are already estimated within existing Partner Body change programmes or as part of BIS-wide reforms, for example, on corporate services and specific digital capabilities. Other costs will be identified as part of development of the transition plan.

76. The new body will be set up to adhere to the Principles of Good Corporate Governance. In setting up the new body, we will align with the requirements of Cabinet Office's Tailored Reviews of NDPBs, and we will put the body into the cycle of tailored reviews in the next parliament.

77. The creation of a strong strategic funding body that is fit for purpose is key to delivering the vision for research and innovation set out in the white paper 'Higher Education: Success as a Knowledge Economy'[11].

7. Conclusion

78. If we are to build on the UK's world-leading reputation in research and innovation, it is vital that the UK research and innovation ecosystem is sufficiently integrated, strategic and agile to meet future challenges, and to deliver national capability for the future that drives discovery and growth.

79. This case demonstrates that the establishment of UK Research and Innovation – a single new NDPB to replace eight existing bodies (the Research Councils and Innovate UK), and integrate the research funding functions of HEFCE, streamlining and simplifying the research and innovation landscape - presents an important opportunity to take a big step towards these aims.

80. Our reforms will:

- maximise the value and benefit from Government's investment of over £6 billion per annum in research and innovation;
- enable cross-cutting funds being held, managed and distributed at arm's length from Government, while avoiding administrative overheads and working around current legal structures;
- eliminate duplication to ensure the new arrangements are efficient and effective, and to ensure all available funding is directed to support research, translation and innovation, not on administrative overheads; and
- establish a system that balances autonomy and independence with cross-cutting ability and flexibility, with decisions delegated to the experts best able to take them for the benefit of their research discipline or distinctive area of expertise.

81. Further work will be undertaken by BIS and its Partner Organisations to develop the new organisation's detailed design, which will enable more detailed costs and benefits to be quantified. However, subject to legislation, BIS is confident that the strategic benefits of this reform, as set out in this case, will outweigh any costs (currently expected to be minimal).

Annex A – Structure and Governance of UK Research and Innovation

The new body will be an NDPB at arm's length from Government in line with our commitment to the Haldane Principle, as set out in paragraph 29. However, as the body will have responsibility for the distribution of over £6 billion per annum of public funding we consider the balance between independence and accountability to Parliament and the public is best met through a statutory corporation. This legal form is most common for Government funding bodies (for example HEFCE) and has accountability to Parliament through the requirement to lay annual audited accounts.

We are conferring use of the Royal Coat of Arms on the new body given its close association with Government. We are also retaining the names and brands of the Research Councils and Innovate UK within UKRI, while preserving the symbolic property associated with them such as their seals and insignia. This will ensure continuity between UKRI and its predecessor bodies, which over the past century have built a world-leading reputation in research and innovation.

A single board and chair to set direction

UKRI's Board will have responsibility for leading on the overall strategic direction, cross-cutting decision-making, and providing advice to the Secretary of State on the balance of funding between research disciplines. The Board will manage funds with cross-disciplinary impact and a 'common research fund' as proposed by Sir Paul Nurse.

The Secretary of State will appoint all of the Board members, as with current arrangements for the Research Councils, HEFCE and Innovate UK. The majority will be non-executives with significant expertise in research or business, ensuring a strategic focus at the head of the organisation that spans blue skies research and business-led innovation. Subject to Parliament, legislation will ensure consideration of the balance of research and business experience in the appointment of Board members.

The Chief Executive (who will be the body's single Accounting Officer) and Chair of UKRI will be very important roles, with oversight of a multi-faceted organisation and an over £6 billion per annum budget. We will ensure that these high-profile global roles attract the highest calibre candidates.

In carrying out its functions, UKRI's board will be supported by a central team of staff. The central team will have responsibility for implementing the Board's decisions and will take on responsibility for back office functions across the organisation, such as financial assurance, audit, procurement, HR and grant administration.

This will remove the current duplication of back office functions across multiple bodies, driving efficiency savings and reducing the administrative burdens placed on research and

innovation leaders, freeing them up to focus on strategic decision-making. It will also help to deliver simplified systems and processes for funding recipients.

UKRI's board will be a strong and influential voice for research and innovation. It will operate at arm's length from Government but, as currently, Ministers will retain the ability to provide high-level direction as to the allocation of funding for research and innovation. This will include setting hypothecated budgets for UKRI's nine autonomous Councils, which are described below.

Leadership and Autonomy

We will retain and strengthen leadership in specific research discipline areas, innovation and England-only research funding by establishing nine Councils within UKRI with delegated autonomy and authority for decisions over which research and innovation programmes to fund.

Seven of the Councils will reflect the functions of the existing Research Councils, one will reflect the functions of Innovate UK and one, Research England, will be established to undertake the England-only functions in relation to research and knowledge exchange that are currently performed by HEFCE. Subject to Parliament, the distinctive focus and remit of the Councils will be enshrined in legislation, mirroring the functions that are currently set out in the royal charters of the Research Councils and Innovate UK, as well as HEFCE's research functions under the 1992 Further and Higher Education Act.

The Councils will provide strategic oversight in the relevant fields of activity and take delegated decisions on scientific, research and innovation matters. They will be led by Executive Chairs, high-profile positions appointed by Ministers on the advice of UKRI's board and reporting to UKRI's CEO. The Executive Chairs will each have significant expertise in their particular fields of activity (for example, medical research or innovation).

In addition to the Executive Chair, each Council will be made up of from five to nine other experienced independent members drawn from the relevant community. The Council members will be appointed by the UKRI Board on the recommendation of the relevant Executive Chair, with the Secretary of State also having the facility to appoint one of the Council members if he wishes. This will reduce the number of Ministerial appointments as at present Ministers appoint every Board member of the nine bodies that will form UKRI.

As currently, the Secretary of State will set budgets for each of the nine Councils through an annual grant letter, taking advice from UKRI's board on strategic priorities and on the balance of funding between research disciplines. The Secretary of State will also set out any funding flexibilities he will grant to the Board in respect of the transfer of funding between Councils. The UKRI Board will not be able to transfer funding unless authorised to do so by the Secretary of State, thereby ensuring that the current system of hypothecated budgets is retained. The CEO of UKRI, as its single Accounting Officer, will establish a framework within which the Councils will have delegated authority for their hypothecated budgets, consistent with the standards of financial management expected of public bodies. Each of the financial processes of UKRI will be established in line with the latest guidance and best practice in respect of managing public money.

Subject to Parliament, the HE and Research Bill will provide for UKRI's Board to delegate responsibility for strategic decision-making at discipline level to the seven UK-wide research discipline Councils. Similarly, the Bill will provide for the Board to delegate responsibility for decision-making in the area of innovation to Innovate UK, and for decisions on the allocation of England-only research funding to Research England.

As set out above, the nine Councils themselves will be responsible for making delegated decisions on scientific, research and innovation matters. Their responsibilities will include:

- developing strategic delivery plans in the relevant areas of activity, consistent with the overarching strategic plan set by the UKRI Board, and submitting these to the Board for approval;
- taking decisions on the prioritisation of their hypothecated budgets within their delegated remits;
- liaison with their community to develop ideas and disseminate strategic outputs; and
- appointing and setting terms and conditions of academic, specialist and research staff in the relevant Council and any associated institutes, within delegated limits. This will ensure that decisions on the employment of specialist staff continue to be made by those with expertise in the relevant discipline areas, in line with the Haldane principle.

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